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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,723	09/17/2003	Chaochuang Zeng	ATHEP122	6055
21912	7590	12/27/2006	EXAMINER:	
VAN PELT, YI & JAMES LLP			EJAZ, NAHEED	
10050 N. FOOTHILL BLVD #200			ART UNIT	PAPER NUMBER
CUPERTINO, CA 95014			2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/27/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/666,723	ZENG ET AL.	
	Examiner	Art Unit	
	Naheed Ejaz	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 17 September 2003.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-22 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-14 and 20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) 15-19, 21 and 22 are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-14 & 20, drawn to receiver, classified in class 375, subclass 316.
 - II. Claims 15-19, 21 & 22, drawn to transmitter, classified in class 375, subclass 295.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II (mentioned above) are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination of transmitter and receiver claims are usable together and has separate utility such as the receiver described in claims 1-14 & 20 does not necessarily require the transmitter in claims 15-19, 21 & 22. Also the transmitter described in claims 15-19, 21 & 22 does not necessarily require the receiver of claims 1-14 & 20. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to

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provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

3. Examiner called Applicant's Attorney Ms. Diana Fu (Registration # 52924) on December 11, 2006 in order to restrict claims according to above-mentioned paragraphs. She elected group I, which includes claims 1-14 & 20.

Abstract

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The abstract of the disclosure is objected to because of the following:

- Abstract is too short and has less than 50 words.
- Delete the title of the invention from the Abstract.

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1- 14 & 20 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility.

8. Refer to claim 1 (taken as a whole), it recites a method of detecting a packet by claiming an algorithm which is performed by manipulating the signals which has no physical structure. Furthermore, the claim does not provide any concrete and tangible result and therefore, has no practical applicability.

9. Claims 2-14 are rejected under 35 U.S.C. 101 because they are based on rejected claim, claim 1.

10. Regarding claim 20 (taken as a whole), it recites a receiver configured to detect a packet by claiming an algorithm which is performed by manipulating the signals which has no physical structure. Moreover, the claim does not provide any concrete and tangible result and therefore, has no physical applicability.

11. Claims 1-14 & 20 also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 1, 12 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (5, 598,429) in view of Yasotharan et al. (2004/0120409) (hereinafter, Yasotharan).

14. Refer to claim 1, Marshall discloses, 'sampling a received signal to produce a sequence of samples wherein the sequence of samples includes a plurality of subsequences of samples' (figure 5, elements 303 & 304, col.2, lines 57-64), 'cross correlating the subsequences of samples with a known form of the subsequence to produce cross correlations' (figure 5, element 307 & figure 8, col.3, lines 4-40). Marshall also processes the digital correlated values (figure 15) but he fails to disclose self correlation.

Yasotharan teaches, 'self correlating the cross correlations to produce a plurality of self correlations' (figure 7, page # 5, paragraphs # 0054), 'summing the self correlations' (figure 8A) (it is noted that adder '+' (figure 8A) is summing the values output from the self correlators (figure 7, elements 414, 416) which reads on claim limitations), 'processing the sum of the self correlations' (figure 7, elements 418 & 422) (it is noted that the test statistic calculator 418 (figures 7 & 8A) sums the self correlated

values '+' (figure 8A) and then detect the train pulse (figure 7, 'Pulse Train Detected/Not Detected') which reads on claim limitations of 'processing the sum of the self correlations').

It would have been obvious to one of ordinary skill in the art, at the time of invention, to implement the teachings of Yasotharan into Marshall in order to achieve symbol synchronization in an OFDM communications system by detecting the training pulse through correlators and self correlators as taught by Yasotharan (page # 1, paragraph # 0001 & page # 5, paragraphs # 0053-0054).

15. As per claim 12, Marshall discloses, 'resetting upon the occurrence of an automatic gain control adjustment' (figure 13, element 701, 'average digital AGC', col.8, lines 30-61).

15. Claim 20 is rejected under the same rationale as mentioned in the rejection of claim 1 above. Furthermore, it is noted that Marshall discloses 'an ADC configured to sample a received signal' (figure 6, elements 301 & 302).

17. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (5, 598,429) in view of Yasotharan et al. (2004/0120409), as applied to claim 1 above, and further in view of Bohnke et al. (2006/0269008) (hereinafter, Bohnke).

18. Refer to claim 9, Marshall and Yasotharan teach all the limitations in the previous claim on which claim 9 depends but they fail to disclose adjustment of the sign of self correlations according to a known sequence.

Bohnke teaches, 'summing the self correlations includes adjusting the sign of the self correlations according to a known sequence' (figures 2 & 6, page # 1, paragraphs #

0009-0012, page # 3, paragraph # 0044, page # 4, paragraph # 0046) (it is noted in the figure 6 cross correlated values 16 are being multiplied by complex conjugated samples (claimed 'self cross correlation') (in the light of Specification, page # 9, lines 10-11) of an expected repetition pattern (claimed 'known sequence') before they are summed by SUM (figure 6) (claimed 'summing the self correlation'). Furthermore, Bohnke discloses that in figure 6, cross correlation peak of the repetition pattern are also detected by '+' & '-' values of phase (page # 3 - 4, paragraph # 0044) which reads on claim limitations of 'adjusting the signal').

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the teachings of Bohnke into Marshall and Yasotharan in order to provide the phase information thus information on the position of the correlation peak in the reference symbol and thus a more accurate and reliable synchronization information as taught by Bohnke (page # 4, paragraph # 0045).

19. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (5, 598,429) in views of Yasotharan et al. (2004/0120409) & Bohnke et al. (2006/0269008), as applied to claims 1 & 9 above, and further in view of Betz et al. (2004/0071200) (hereinafter, Betz).

20. Regarding claim 10, in addition to rejection of claim 9 above, Marshall, Yasotharan and Bohnke teach all the limitations in the previous claim on which claim 10 depends but they fail to disclose pseudorandom sequence.

Betz discloses, 'self correlations according to a pseudorandom sequence' (figure 4, page # 5, paragraph # 0052).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the teachings of Betz into Marshall, Yasotharan and Bohnke in order to achieve direct acquisition of spread spectrum signals using long codes as taught by Betz (page # 1, paragraph # 0001).

21. Claims 2-6, 8, 11, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (5, 598,429) in view of Yasotharan et al. (2004/0120409), as applied to claim 1 above, and further in view of Husted et al. (2002/0183027) (hereinafter, Husted).
22. Refer to claim 2, Marshall and Yasotharan teach all the limitations in the previous claim on which claim 2 depends but they fail to disclose comparing of magnitude of the sum of the self correlations to a threshold.

Husted teaches, 'processing the sum of the self correlations includes comparing the magnitude of the sum of the self correlations to a threshold' (page # 5, paragraphs # 0060-0065).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to implement the teachings of Husted into Marshall and Yasotharan in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

23. Refer to claims 3, 4 & 5, Marshall and Yasotharan teach all the limitations in the previous claim on which these claims depend but they fail to disclose first and second threshold and comparison of the summed magnitude of the self correlation.

Husted discloses two threshold windowing process on a self correlation measurement (page # 5, paragraph # 0065) (claimed first and second thresholds) and he summed the magnitude of the real and imaginary parts of the self correlation (page # 5, equation # 7) (claimed 'magnitude of the real part of the sum of the self correlations and the magnitude of the imaginary part of the sum of the self correlations') before comparing them with the first and second threshold (page # 5, paragraphs # 0061-0065) (claimed comparison of the magnitude of summed sums and summed magnitudes to a second threshold).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to implement the teachings of Husted into Marshall and Yasotharan in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

24. Refer to claim 6, Marshall and Yasotharan teach all the limitations in the previous claim on which claim 6 depends but they fail to disclose first threshold and second threshold comparison for the summed magnitudes of the self correlations.

Husted discloses, 'processing the sum of the self correlations includes comparing for a period of time the magnitude of the sum of the self correlations to a first threshold and summing magnitudes of the sum of the self correlation that exceed the first threshold and comparing the summed magnitudes to a second threshold' (page # 5, paragraphs # 0061-0063 & 0065).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to implement the teachings of Husted into Marshall and Yasotharan in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

25. Refer to claim 8, Marshall and Yasotharan teach all the limitations in the previous claim on which claim 8 depends but they fail to disclose determination of packet boundary based on the time and the sum of the self correlation is maximum.

Husted teaches, 'processing the sum of the self correlations includes determining a packet boundary based on the time when the sum of the self correlations is determined to be a maximum' (page # 5, paragraphs # 0061, 0063 & 0064).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to implement the teachings of Husted into Marshall and Yasotharan in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of

the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

26. Refer to claim 11, Marshall and Yasotharan teach all the limitations in the previous claim on which claim 11 depends but they fail to disclose resetting the sum to zero.

Husted teaches, 'resetting the sum of the self correlations to zero upon the occurrence of an automatic gain control adjustment' (figure 3, page # 4, paragraph # 0043-0048) (it is noted in the mentioned paragraphs that if the acc_count counter is zero, accumulator adcpwr1 is being reset and it happens during AGC operation (page # 4, paragraph # 0043-0045) (claimed 'occurrence of an automatic gain control'), furthermore, AGC 230 takes the power measurement from power detector 220, which is connected to self correlation 225, (figure 3, page # 2, paragraph # 0024) and these measurements involves maximum output zero based on the log table calculation (page # 3, paragraph # 0035) which reads on claim limitations of 'resetting the sum of the self correlations to zero' since both power detector 220 and self-correlator 225 are connected together in order to output the signal to the AGC control 230 (figure 3).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to implement the teachings of Husted into Marshall and Yasotharan in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as

taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

27. Refer to claim 14, Marshall and Yasotharan teach all the limitations in the previous claim on which claim 14 depends but they fail to disclose reducing the number of bits.

Husted teaches, 'rescaling the received signal to reduce the number of bits required for cross correlation and self correlation' (page # 2, paragraph # 0022, lines 6-13).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to implement the teachings of Husted into Marshall and Yasotharan in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

28. Claims 7 & 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (5, 598,429) in view of Yasotharan et al. (2004/0120409), as applied to claim 1 above, and further in view of Kim (7,012,881).

29. Refer to claims 7 & 13, Marshall and Yasotharan teach all the limitations in the previous claim on which claims 7 & 13 depend but they fail to disclose determination of frequency offset.

Kim discloses, 'processing the sum of the self correlations includes determining a frequency offset from the phase of the sum of the self correlations' (figures 2 & 3, col.8, lines 40-67), 'including determining a frequency offset from the angle of the sum of the self correlations' (figures 2 & 3, col.8, lines 40-67).

It would have been obvious to one of the ordinary skill in the art, at the time of invention, to implement the teachings of Kim into Marshall and Yasotharan in order to estimate frequency offset for OFDM and achieve frequency synchronization as taught by Kim (col.3, liens 39-54) thus enhance system performance.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Lucas et al. (5,544,167) teach transmission method for CDMA radiotelephone communications, and apparatuses for implementing such method.
- Garrett et al. (6,724,834) disclose threshold detector for detecting synchronization signals at correlator output during packet acquisition.
- Kim et al. (2006/0072689) teach matched filter and cross correlation method.

Contact Information

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naheed Ejaz whose telephone number is 571-272-5947. The examiner can normally be reached on Monday - Friday 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Naheed Ejaz
Examiner
Art Unit 2611

N.E.
12/20/2006


PANKAJ KUMAR
PRIMARY PATENT EXAMINER